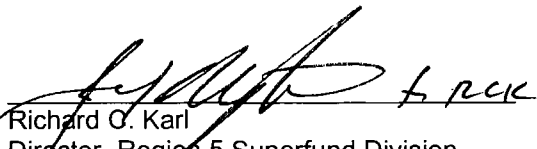




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Five-Year Review Report
Third Five-Year Review Report
for
Kurt Manufacturing Company
City of Fridley
Anoka County, Minnesota
May 2005


Richard G. Karl
Director, Region 5 Superfund Division
United States Environmental Protection Agency

5/26/05

Addendum to ARAR Review

As stated in the following Kurt Manufacturing Company Five Year Review report, prepared by the MPCA, the Safe Drinking Water Act (SDWA) Federal MCLs are not cited in the MERLA Enforcement Decision Document (MEDD) and Consent Order issued for the site by MPCA. Instead, the MPCA's MEDD cites the Recommended Allowable Limits (RALs) and Health Risk Limits (HRLs) established by the Minnesota Department of Health (MDH) as ground water cleanup levels for the contaminants of concern (COCs) at the site. As Table 2 of the report shows, the RALs and HRLs for Cis 1,2-Dichloroethene and Trans 1,2-Dichloroethene are the same as the MCLs for those contaminants. However, for Tetrachloroethene and Trichloroethene, the RALs and HRLs are slightly less stringent than the MCLs. MCLs are established under the SDWA as standards for public water supplies, but are generally used as ARARs in the Superfund Program for ground water cleanup. The MDH RALs and HRLs apply to private drinking water wells and are used by the State under MERLA for ground water cleanup. As there is no public water supply being impacted or threatened by contaminants from the site, U.S.EPA considers MPCA's remedy protective, but recommends use of the Federal MCLs where feasible as ultimate cleanup levels for ground water.

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Kurt Manufacturing Company

City of Fridley

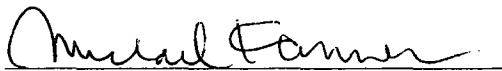
Anoka County, Minnesota

March 2005

PREPARED BY:

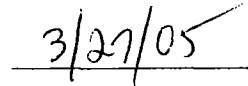
**Minnesota Pollution Control Agency
St. Paul, Minnesota**

Approved by:



Michael Kanner
Manager, Superfund Section
Minnesota Pollution Control Agency

Date:

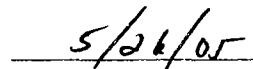


Approved by:



Richard C. Karl
Director, Region 5 Superfund Division
United States Environmental Protection Agency

Date:



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List of Acronyms

ACLs	Alternate Concentration Levels
AMR	Annual Monitoring Report
AOC	Administrative Order by Consent
ARARs	Applicable or Relevant and Appropriate Requirements
BNR	Burlington Northern Railroad
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
COC	Contaminant of Concern
CTF	Containment and Treatment Facility
EPA	United States Environmental Protection Agency
HRL	Health Risk Level
IC	Institutional Control
LMCLs	Listed Maximum Concentration Levels
MCES	Metropolitan Council Environmental Services
MCLs	Maximum Contaminant Levels
MDH	Minnesota Department of Health
MERLA	Minnesota Environmental Liability and Response Act
MPCA	Minnesota Pollution Control Agency
MWW	Minneapolis Water Works
NCP	National Oil and Hazardous Substances Contingency Plan
NIROP	Naval Industrial Reserve Ordnance Plant
NPDES	National Pollutant Discharge Elimination System
NPL	Nation Priorities List
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
POTW	Publicly Owned Treatment Works
PRP	Potentially Responsible Party
RA	Remedial Action
RAGS	Risk Assessment Guidance for Superfund
RAL	Recommended Allowable Limit
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SDWA	Safe Drinking Water Act
TBCs	To be Considereds
TCE	Trichloroethylene
VOCs	Volatile Organic Compounds
WasteLAN	The Regional database related to CERCLIS

Executive Summary

The remedy for the Kurt Manufacturing Company Site located in Fridley, Minnesota, included capping the former sump source area with an impervious material, abandoning the shallow production well, pumping ground water to control the ground water gradient in the alluvium and Prairie du Chien aquifers, and long-term monitoring to assess response action performance. The trigger for this five-year review was the completion date for the previous five-year review.

In March 1984, the sump was removed, contaminated soil was excavated and the area was capped with concrete. The shallow production well was also abandoned. Ground water extraction was initiated during 1986 and continues to the present. The ground water extraction remedy is effectively removing VOCs from the shallow and intermediate aquifers.

The remedy is functioning as intended and is protective of human health and the environment in the short-term. Long-term protectiveness needs to be verified based on the follow-up actions and recommendations. The remedy would be confirmed to be fully protective if recommendations cited in Section IX are implemented so that it can be determined that the performance requirements of the remedy cited in Section IV are being met.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Kurt Manufacturing Company		
EPA ID (from WasteLAN): MND059680165		
Region: 5	State: MN	City/County: City of Fridley/Anoka County
SITE STATUS		
NPL status: Final		
Remediation status (choose all that apply): Operating		
Multiple OUs? No	Construction completion date: 9/20/1995	
Has site been put into reuse? No		
REVIEW STATUS		
Lead agency: State		
Author name: David Douglas		
Author title: Project Manager	Author affiliation: MN Pollution Control Agency	
Review period:** 11/2004 through 2/16/2005		
Date(s) of site inspection: 12 / 22 / 2004		
Type of review: Policy		
Review number: 3 (third)		
Triggering action: Previous Five-Year Review Report		
Triggering action date (from WasteLAN): 2/16/2000		
Due date (five years after triggering action date): 2/16/2005		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

1. VOCs continue to be detected in some Kurt Manufacturing Company on-site Prairie du Chien monitoring wells.
2. Additional documentation and discussion should be provided in the semi-annual monitoring reports submitted to the MPCA regarding the remedial system operation, maintenance and monitoring.
3. Before Site delisting from the state Superfund list, institutional controls are needed to document ground water contamination, well abandonment, the capping at the former sump source area and the possible presence of contaminants beneath the building.
4. VOCs from the Site remain in the shallow and intermediate aquifers in concentrations greater than the HRLs and MCLs.
5. Some water from the groundwater treatment system is used to wash parts in the Kurt Manufacturing Company building. The worker exposure impacts from possible off-gassing of VOCs from this water is not known.

Recommendations and Follow-up Actions:

1. Need to continue to monitor the onsite Prairie du Chien wells to verify that the downward long-term VOC trends in the onsite Prairie du Chien wells continue. Monitor regional flow in the Prairie du Chien aquifer to confirm interpretation of the Prairie du Chien flow regime.
2. Need more detail in the monitoring reports submitted to the MPCA regarding the ground water remediation system operation, maintenance and monitoring to better document the effectiveness of the system. At a minimum this should include effluent concentration data, pumping rates, discharge volumes, mass removal calculations, maintenance records and a copy of the MCES quarterly reports.
3. Before Site delisting from the state Superfund list, complete and record a MERLA affidavit and Environmental Restrictive Covenant that documents the waste left in place, the need to maintain the cap at the former sump area and the possibility of contamination beneath the building.
4. Continue the operation, maintenance and monitoring of the pumpout system, routine ground water monitoring, and reporting with review and approval by the MPCA.
5. Determine the worker exposure impacts from possible off-gassing of VOCs from water from the ground water treatment system.

Protectiveness Statement(s):

The remedy is functioning as intended and is protective of human health and the environment in the short-term. Long-term protectiveness needs to be verified based on the follow-up actions and recommendations. The remedy would be confirmed to be fully protective if recommendations cited in Section IX are implemented so that it can be determined that the performance requirements of the remedy cited in Section IV are being met.

Other Comments: None

FIVE-YEAR REVIEW REPORT

**Kurt Manufacturing Company
Fridley, Minnesota**

I. INTRODUCTION

The purpose of the Five-Year Review is to determine whether the remedy at the Kurt Manufacturing Company Site is protective of human health and the environment. The methods, findings and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues during the review, if any, and identify recommendations to address them.

The Agency is preparing this Five-Year Review report pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to ensure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such actions.

The Agency interpreted this requirement further in the NCP; 40 CFR Section 300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

The Minnesota Pollution Control Agency (MPCA) staff has completed a Five-Year Review of the Remedial Actions (RAs) conducted at the Kurt Manufacturing Company Site in Fridley, Minnesota. This Five-Year Review evaluates whether the RA remains protective of public health, welfare, and the environment and was conducted from November 2004 through February 2005.

This third review focuses on the protectiveness of the Kurt Manufacturing Company Site's RA, eighteen years from the time the RA commenced. This is the third Five-Year Review completed by the MPCA. The first Five-Year Review was completed during

March 1994 and the second review was completed on December 28, 1999. The EPA concurred with the second Five-Year Review on February 16, 2000.

II. SITE CHRONOLOGY

Table 1: Chronology of Site Events

Date	Event
1982 - 1985	Remedial investigations performed at the Kurt Manufacturing Company Site.
4/24/1982	MPCA issued a Request for Response Action to the Kurt Manufacturing Company.
8/28/1984	Response Order by Consent was effective.
1984	Site listed on the National Priorities List and the Minnesota Permanent List of Priorities.
3/1984	Removed the sump and some soil and capped the area over the former sump at the metal storage bin.
5/13/1986	MPCA issued the Minnesota Enforcement Decision Document.
1986	Ground water response actions implemented.
3/1994	Completion of the first Five-Year Review.
1995	Deep production well taken out of service.
1997 - 2004	Completed additional site investigations.
2/2000	EPA concurred on completion of the second Five-Year Review.
1986-present	Ongoing implementation of the ground water response actions.

III. BACKGROUND

Physical Characteristics

The Kurt Manufacturing Company property (Site) covers approximately seven acres and is located at 5280 Main Street NE in Fridley, Anoka County, Minnesota (Figure 1).

Adjacent Land and Resource Use

The Site is bounded on the west by a railroad yard and industrial property further to the west, industrial properties on the north and south, and residential properties to the east. The Naval Industrial Reserve Ordnance Plant (NIROP) located approximately ½ mile southwest of the Site and the Dealers Manufacturing Company located approximately two blocks south of the Site have documented soil and ground water contamination issues. The NIROP Site is listed on the National Priorities List (NPL). The Mississippi River is located approximately 3,000 feet to the west and flows to the south. The city of Fridley's Municipal Well 13 is located approximately 2,900 feet southwest of the Site.

History of Contamination

Kurt Manufacturing Company has operated a precision machining and metal fabrication plant at this location since 1960. Cutting oils and solvents are utilized as part of the metal finishing operations performed at the plant. Until 1982, contaminated metal cuttings were placed in storage bins located outside of the plant loading dock area for pickup and recycling. There was a sump at the base of the storage bin. The storage bin and sump were located just north and east of monitoring well MW-3 and MW-4 (20 feet deep) and southeast of the former deep production well (90 feet deep) (see Figure 2).

In April 1982, the shallow on-site production well was sampled as part of an investigation at the NIROP Site. Laboratory analysis detected VOCs in the water sample collected from the shallow production well. An onsite underground storage tank (UST) containing waste oil was believed to be the source of the contamination. The MPCA requested that Kurt Manufacturing Company investigate the integrity of the UST and conduct a shallow ground water investigation. The UST was removed in July 1982 and it was determined the UST was not the source for the contaminated ground water. However, ground water samples collected from the monitoring wells installed as part of the UST investigation contained tetrachloroethene (also known as perchloroethene) (PCE) as well as other volatile organic compounds (VOCs). Further investigation indicated that solvents, including PCE, leaked from the sump at the metal cuttings storage bin and contaminated the soil and ground water at the Site. Ground water was found to contain elevated concentrations of PCE and trichloroethene (TCE). In March 1984, the sump was removed, contaminated soil was excavated and the area was capped with concrete.

Initial Response

Soil and ground water assessments were performed beginning in 1982. The assessments indicate the surficial sediments consist of unconsolidated sandy alluvial deposits which extend to a depth of 10 to 40 feet below the ground surface (bgs). A silty sand glacial till unit underlies most of the Site. The top of this layer is generally encountered 10 to 40 feet below ground surface (bgs). A thick glacial outwash unit, consisting primarily of sand, is the lowermost unconsolidated deposit. The outwash is typically 50 to 60 feet thick. Ground water was encountered at an approximate depth of 30 feet in the unconsolidated sediments. The uppermost bedrock unit is the St. Peter Sandstone, which was encountered at 86 to 110 feet bgs, and is approximately 10 to 30 feet thick. The Prairie du Chien Limestone was encountered at 116 to 120 feet bgs, with the Jordan Sandstone encountered at 250 feet bgs.

On April 24, 1984, the MPCA issued a Request for Response Action (RFRA) to Kurt Manufacturing Company as a basis for negotiating a Response Order by Consent (Consent Order). The Consent Order was subsequently negotiated and became effective on August 28, 1984, with a modification of Part V, Task C, Exhibit A effective June 25, 1985.

The Site was placed on both the Minnesota Permanent List of Priorities (PLP) and the NPL in 1984.

A Remedial Investigation and Feasibility Study (RI/FS) was completed in 1985. On May 13, 1986, the MPCA finalized the Minnesota Enforcement Decision Document (MEDD), which documented the approved response action. The response actions included abandoning the shallow production well, removal of the sump, excavation of contaminated soil, capping the surface at the former metal cuttings storage bin; installing and operating two ground water pumpout wells (Wells A and B), and long-term ground water monitoring.

In 1998, additional investigative work was completed including an assessment of the integrity of the casing for the deep production well, advancement of soil borings to more clearly define and assess the source of contamination, completion of a soil gas survey to define the on-site plume of shallow soil and ground water contamination, and the installation of two bedrock monitoring wells to assess off-site migration of VOCs in the Prairie du Chien aquifer.

The ground water pumpout system has been operational since 1986. Ground water was originally pumped from Wells A and B and discharged to the sanitary sewer under a permit issued by the Metropolitan Council Environmental Services (MCES). In 1994, a third pumpout well (Well C) was installed and pumpout Well A was abandoned due to poor recovery. Ground water pumping from Well B was discontinued and Well B is *currently used as a monitoring well. The ground water from the pumpout wells was treated using an air stripper prior to discharge to the sanitary sewer. This ground water treatment process has been modified and will be discussed later in this review.*

Basis For Taking Action

Hazardous substances that have been detected in each media include:

<u>Soil</u>	<u>Ground Water</u>
PCE	PCE
TCE	TCE
1, 2-Dichloroethene (DCE)	DCE
1, 1, 1-Trichloroethane (TCA)	TCA

VOC concentrations in the ground water exceed applicable Minnesota Department of Health (MDH) Health Risk Limits (HRLs) and/or EPA Maximum Contaminant Levels (MCLs).

IV. REMEDIAL ACTIONS

Remedy Selection

The August 1984 Consent Order required Kurt Manufacturing Company to complete initial remedial measures to close the sump, conduct an RI/FS, submit a Response Action Plan (RAP), implement the response actions, and conduct long-term ground water monitoring. The MPCA subsequently finalized a MEDD on May 13, 1986 which specified the approved response actions. The response actions are:

- Long-term operation and maintenance of a contaminated ground water gradient control, pumpout and treatment system which will prevent migration of contaminated ground water;
- Capping to reduce infiltration through contaminated soils;
- Well abandonment to reduce migration of contaminated ground water; and
- Long-term monitoring to assess response action performance between aquifers.

ARAR Review

As stated above, the Five-Year Review is being conducted to determine whether the Kurt Manufacturing Company Site RA remains protective of public health and the environment. The more specific purpose of the reviews is two-fold: (1) to confirm that the remedy as spelled out in the MEDD and/or remedial design remains effective at protecting human health and the environment, e.g., the remedy is operating and functioning as designed, institutional controls are in place and are protective and (2) to evaluate whether original cleanup levels remain protective of human health and the environment. ARARs and "To Be Considereds" (TBCs) are key elements in fulfilling these two purposes.

ARARs Cited in the MEDD

Resource Conservation and Recovery Act (RCRA)

Requires the removal and disposal of waste residues and soil contaminated with hazardous waste.

Federal Clean Water Act, 33 U.S.C. Section 1251, et seq., as amended

Requires U.S. EPA to establish water quality criteria for bodies of water, including ground water, based on the effects of pollutants on human health and aquatic life. Section 121 of CERCLA states that remedial actions shall attain these water quality criteria where they are relevant and appropriate under the circumstances of the release, based on the usage or potential usage of the water receiving the release.

Section 307 (b) of the Clean Water Act, Section 1317 (b) and regulations promulgated thereunder (40 CFR 403) require publicly owned treatment works (POTWs) to develop and enforce treatment standards so as to prevent interference with operation of the POTW and pass through of the pollutants through the system. The current pretreatment permit limits to the POTW, as specified by MCES Special Discharge Permit No. 2016, are 3 milligrams per liter (mg/l) for any single toxic organic and 10 mg/l for the total of all toxic organic compounds.

EPA Policy Memorandum, “Discharge of Wastewater from CERCLA Sites into POTWs,” dated April 15, 1986

In order to safely discharge contaminated ground water from a Superfund site into a POTW, certain factors need to be considered. These factors were derived from an EPA policy memorandum, “Discharge of Wastewater from CERCLA Sites into POTWs,” dated April 15, 1986. The factors are as follows:

1. Potential of pollutants to cause pass through or interference, including a health hazard to employees at the POTW.
2. The ability of the POTW to ensure compliance with applicable treatment standards and requirements.
3. The POTWs record of compliance with the NPDES permit and pretreatment program requirements.
4. The potential for volatilization of the wastewater and its impact upon air quality.
5. The potential for ground water contamination from transport of CERCLA wastewater to the POTW, and the need for ground water monitoring.
6. The potential effect of the CERCLA wastewaters upon the POTWs discharge into receiving waters.

To Be Considereds Cited in the MEDD

Minnesota Department of Health Recommended Allowable Limits

MDH Recommended Allowable Limits (RALs) were cited in the MEDD as possible ground water cleanup levels that could be established where no MCL was established. The MEDD cited RALs for the COCs. RALs have now been replaced by MDH Health Risk Limits (HRLs), which are TBCs as explained below.

ARARs/TBCs Not Cited in the MEDD

Safe Drinking Water Act (SDWA) (40 CFR Parts 141 - 146)

Establishes Federal MCLs and Maximum Contaminant Level Goals to protect public drinking water supplies. This ARAR applies to any aquifer that could be used for a public water supply.

The MEDD stated that “the recommended alternative, when implemented would effectively minimize migration of contaminated ground water beyond the Site boundary and thereby provide reasonable protection of public health, welfare and the environment”. The MCLs for VOCs detected in one or more wells at the Site are shown in Table 2.

Minnesota Rules Parts 4717.7100 to 4717.7800

A HRL is the concentration of a ground water contaminant or mixture of ground water contaminants that can be safely consumed daily for a lifetime. A HRL is expressed as a concentration in parts per billion or calculated as a “hazard index.”

The MDH developed HRLs using scientific risk assessment methods and data. The HRLs are calculated using the same methodology as for the “recommended allowable limits,” which were advisory levels MDH used before the HRL rules were promulgated. HRLs apply to private ground water drinking water wells only. HRLs are not promulgated as cleanup ARARs, but are used by the MPCA as cleanup TBCs by agreement between the MPCA and the MDH. The HRLs replace all of the RALs cited in the MEDD. The HRLs for VOCs detected in one or more wells at the Kurt Manufacturing Site are listed in Table 2.

Table 2: MCLs, HRLs and RALs for COCs at the Site

Compound	MCL (ug/l)	HRL (ug/l)	RAL (ug/l)
1,1,1-Trichloroethane			
Tetrachloroethene	5	7	6.9
Trichloroethene	5	30*	31.2
Cis 1,2-Dichloroethene	70	70	70
Trans 1,2-Dichloroethene	100	100	-
ug/l – Micrograms per liter			

* The HRL is 30 ug/l; however, MDH recommends an exposure limit of 5 ug/l based on new data since the HRL was established.

Minnesota Rules Chapter 7060

Establishes uses and the nondegradation goal for ground water, as well as restoration of contaminated aquifers for use as potable water supply. This ARAR establishes a goal of returning contaminated ground water to potability for both public and private water

supplies and reinforces using MCLs as ARARs where the ground water under the Site and between the site boundary and the river would be used for public water supplies and reinforces using HRLs as TBCs in these same areas where the ground water would be used for a private water supply.

Institutional Controls

MDH requires notification prior to installing a well. The MDH well code also places restrictions on well construction based on the geologic conditions. The combination of the well installation notification requirements and the MDH well construction code appear to provide sufficient institutional controls to restrict well installation.

Remedy Implementation

The Consent Order documented the process to establish the response actions and the MEDD documented the approved response actions. The approved response actions included capping the sump area with an impervious material, abandoning the shallow production well, pumping ground water to control the ground water gradient in the alluvium and Prairie du Chien aquifers, and long-term monitoring to assess response action performance.

In March 1984, the sump was removed, a small volume of soil was excavated and the area was capped with concrete (Figure 2). The shallow production well was also abandoned. The file indicates that records regarding the soil disposal are not available.

The ground water extraction system was placed into operation in 1986. The ground water extraction system originally consisted of two pumpout wells (Well A and Well B). A third pumpout well (Well C) was installed in 1994 and Well A was abandoned due to poor recovery (Figure 2). Pumping from Well B was discontinued and Well B is currently used as a monitoring well. The ground water from the pumpout wells originally flowed through an air stripper for treatment prior to discharge to a holding tank, which is located inside the main manufacturing building. The ground water currently passes through the air stripper, but active treatment is no longer performed because of the low VOC concentrations in the ground water. Some of the water in the holding tank is reused as metal finish rinse process water. The remaining water is discharged into the sanitary sewer for treatment at the Metropolitan Wastewater Treatment Facility, a POTW, under an MCES permit. The discharge to the sanitary sewer occurs at the manhole located just west of Well C. Kurt Manufacturing Company has maintained, operated and monitored the ground water extraction system from 1986 through the present.

System Operations and Maintenance

Kurt Manufacturing Company is performing ongoing operation, maintenance and monitoring for the ground water extraction system. The primary activities include the following:

- Monthly operational and equipment inspections;
- Quarterly sampling and analysis of the discharge from the pumpout well to the sanitary sewer per the requirements of the MCES discharge permit;
- Submittal of a quarterly discharge report to MCES;
- Semi-annual water level measurements at select monitoring wells;
- Semi-annual sampling at pumpout well C and select monitoring wells;
- Routine maintenance as required by site specific conditions; and
- Submittal of a semi-annual ground water monitoring report to the MPCA.

A new flow meter was installed in February 2004. The new flow meter indicated the discharge rate was approximately 17 gallons per minute (gpm), which was lower than the 30 to 40 gpm discharge rate recorded by the previous meter. A review of the water levels at the monitoring wells and the pumpout well do not indicate a significant change in water levels, indicating that draw-downs were maintained.

Routine maintenance at the ground water extraction system consists primarily of cleaning the pumps and the discharge piping and replacement of worn-out equipment. There have been no shut downs of the extraction system for a long enough period of time to adversely affect the remedial action. The system operation, maintenance and monitoring data are presented in an annual report that is submitted to the MPCA for review and comments.

V. PROGRESS SINCE THE LAST REVIEW

The last Five-Year Review, completed in 1999, contained several recommendations that are summarized as follows:

- Continue to pump ground water from Well C at the current pumping rate of 30 to 40 gpm;
- Continue the semi-annual monitoring program;
- Continue to sample Fridley municipal well 13 on an annual basis to determine if PCE and TCE impacts are reaching the well; and
- Evaluate the presence of PCE impacts in the Prairie du Chien aquifer west of the site.

Ground water extraction from Well C continues with reuse of some of the water and discharge of the remaining water to the sanitary sewer. A new flow meter was installed during February 2004. The new flow meter indicates a flow rate of approximately 17 gpm, which compares to 30 to 40 gpm recorded by the previous flow meter. The consultant for Kurt Manufacturing Company indicates the new meter was calibrated by the manufacturer and appears to be accurate. The water levels at the monitoring wells and the pumpout well are similar which would indicate there has not been a change in the pumping rate. It appears the previous meter was providing an erroneously high flow rate. The pump is currently pumping at a rate of 17 gpm as recorded by the recently installed flow meter.

Semi-annual sampling and analysis for VOCs is performed at select monitoring wells and the pumpout well. The data is submitted to the MPCA in semi-annual monitoring reports. The monitoring plan is reviewed annually.

The city of Fridley has been collecting an annual water sample from municipal well 13 for VOC analysis. The laboratory reports supplied by the city of Fridley indicate the target VOCs were not detected in the samples collected in 2002 and 2003.

The MPCA requested that the Kurt Manufacturing Company complete an assessment of the potentiometric surface in the Prairie du Chien aquifer using available wells completed in this aquifer in the Fridley area. Kurt Manufacturing submitted a potentiometric surface map in September 2004 (Figure 9).

VI. FIVE-YEAR REVIEW PROCESS

Administrative Components

The Five-Year Review was initiated on November 12, 2004. The Kurt Manufacturing Company representative was notified of the initiation of the Five-Year Review during November 2004. The review components included:

- Community Involvement;
- Document Review;
- Data Review;
- Site Inspection;
- Local Interviews; and
- Five-Year Review Report Development and Review.

Community Involvement

Representatives of Kurt Manufacturing Company, MCES and the City of Fridley were notified by a telephone interview that a Five-Year Review was being performed. None of the contacted parties expressed a significant concern regarding the status and protectiveness of the remedy.

On January 13, 2005 a notice was published in the *Fridley Columbia Heights Focus* newspaper announcing that a Five-Year Review was being conducted for the Kurt Manufacturing Company Site.

Document Review

This Five-Year Review consisted of a review of relevant documents including the Consent Order, the MEDD, additional assessment reports, annual monitoring reports

(AMRs), MPCA staff response letters and the previous Five-Year Review reports. A list of the documents reviewed is presented in the Bibliography.

Data Review

Ground water extraction has occurred since 1986, with ground water currently pumped from Well C. The current pumping rate is approximately 17 gpm, which is significantly lower than the 30 to 40 gpm previously reported. It appears the previous flow meter was reporting an erroneously high flow rate. The ground water is pumped through an air stripper to a holding tank. Some of the water from the holding tank is reused to wash metal parts and the remaining water is discharged to the sanitary sewer. The discharge water continues to flow through the air stripper; however, treatment has been discontinued. Kurt Manufacturing Company indicated during the site visit that the VOC concentrations are low enough in the ground water influent that active treatment is no longer necessary to meet the discharge criteria set in the MCES permit for discharge to the sanitary sewer. This was confirmed by a review of the last four quarterly reports.

The ground water is discharged to the sanitary sewer under a permit (no. 2016) from the MCES. The current permit is effective through August 31, 2007. The discharge is sampled quarterly and reported to MCES in quarterly monitoring reports. MCES staff indicated the discharge has been in compliance with the discharge permit.

Pumpout Well C is approximately 60 feet deep and is screened from 45 to 60 feet. PCE comprises over 95 percent of the total VOC concentration detected at pumpout Well C over the last five years. The PCE concentration at pumpout Well C ranged from 580 ug/l in June 2004 to 3400 ug/l in November 2003 (Table 3 and Figure 7). Additional data is needed to determine if the significant decrease in the PCE concentration documented in the June 2004 sample is anomalous or represents a long-term decrease in the PCE concentration.

The existing monitoring well network consists of shallow, intermediate and deep wells. The shallow wells, which are less than 52 feet deep, include MW-1 through MW-6, MW-10 and MW-12. The intermediate wells, which are between 75 and 100 feet deep, include MW-7, MW-8, MW-9 and Well B (former pumpout well). The deep wells include PC-1, PC-2 and the former deep production well. Wells PC-1 and PC-2 are approximately 155 feet deep and are completed in the Prairie du Chien. The former deep production well terminates at a depth of 322 feet, and has an open borehole from 220 to 322 feet.

The ground water table was measured at an approximate depth of 25 to 35 feet bgs. The horizontal ground water flow direction is generally from south to north in the shallow aquifer (Figure 3), from the southwest to northeast in the intermediate aquifer (Figure 4) and from the southeast to northwest in the deep aquifer (Figure 5). The ground water elevation data indicates that pumping Well C has created a cone of depression in the shallow and intermediate aquifers. There are three on-site wells in the deep aquifer used to prepare the ground water contour map. Kurt Manufacturing Company, at the request

of the MPCA, has prepared a potentiometric surface map for the Prairie du Chien aquifer which utilized data from 19 wells over a larger area which is discussed below.

For the shallow wells, MW-6 has historically had the highest VOC concentrations including 1600 ug/l of PCE in the June 2004 sample (Table 3). In the last five years, the PCE concentration at MW-6 has ranged from 1100 ug/l to 7900 ug/l. Monitoring well MW-6 is located hydraulically downgradient of the former metal cuttings storage bin and adjacent to pumpout Well C. Laboratory analysis has not detected the target VOCs in the ground water samples collected from MW-1, MW-4 and MW-10 in the last five years. Monitoring wells MW-1 and MW-4 are located along the eastern property line and MW-10 is located to the north on the adjacent property. Monitoring well MW-5, which is located along the south-central property line, historically has contained elevated concentrations of the target VOCs. The data trend lines indicate the PCE concentration has been stable to decreasing at MW-2, MW-3, and MW-5 and has been increasing at MW-6 and MW-12 (Figure 6).

Monitoring well MW-7, which is located in the immediate vicinity of the former metal cuttings storage bin, has the highest VOC concentrations of the intermediate wells. The PCE concentration at MW-7 was 47 ug/l in the June 2004 sample and has ranged from 47 ug/l to 1700 ug/l in the last five years (Table 3). The TCE concentration at MW-7 was 75 ug/l in the June 2004 sample and has ranged from 75 ug/l to 1600 ug/l in the last five years. The VOC concentrations at MW-8 and MW-9 are significantly lower. Well B contains elevated VOC concentrations, including 450 ug/l of DCE in the June 2004 sample. The data trend lines indicate the PCE concentration is decreasing at MW-7 and Well B and slightly increasing at MW-8 and MW-9 (Figure 7).

For the deep wells, PC-2, which is located along the southwest corner of the property, has historically contained the highest VOC concentrations. In the last five years, the PCE concentration has ranged from 8.6 ug/l in the June 2004 sample to 750 ug/l in the June 2002 sample (Table 3). The PCE concentration decreased from 340 ug/l in the November 2003 sample to 8.6 ug/l in the June 2004 sample. The overall data trend line indicates an increasing PCE concentration at PC-2 since sampling began in 1998, although the PCE concentration appears to be decreasing since 2002 (Figure 8). Additional data is needed to determine if the significant decrease in the PCE concentration documented in the June 2004 sample is anomalous or represents a long-term decrease in the PCE concentration. The target VOCs have not been detected in the samples collected in the last five years from PC-1, which is located along the northwest corner of the subject property. The VOC concentrations in the former deep production well are below the MCLs and the total VOC concentration has remained relatively stable over the last five years. The data indicates a general decrease in the PCE concentration and an increase in the DCE concentration at the former deep production well.

Table 3: PCE Concentrations

	MCL (ug/l)	HRL (ug/l)	Concentration Range (June 2000 – June 2004) (ug/l)	Concentration (Last sample in June 2004) (ug/l)
Shallow Wells				
MW-1	5	7	ND	ND
MW-2	5	7	ND – 11	ND
MW-3	5	7	10 – 110	67
MW-4	5	7	ND	ND
MW-5	5	7	4.7 – 85	14
MW-6	5	7	1,100 – 3,900	1,600
MW-10	5	7	ND	ND
MW-12	5	7	2.9 – 24	20
Intermediate Wells				
MW-7	5	7	47 – 1,700	47
MW-8	5	7	3.9 – 23	15
MW-9	5	7	ND – 1.4	ND
Well B	5	7	ND – 1,100	ND
Deep Wells				
PC-1	5	7	ND	ND
PC-2	5	7	8.6 – 750	8.6
Deep Production Well	5	7	ND – 5.5	3.1
Pumpout Well				
Well C	5	7	580 – 3,400	580
ug/l – Micrograms per liter				
ND – Not detected at or above the laboratory reporting level				

NIROP Monitoring Well 5PC is located approximately 900 feet to the southwest of PC-2 on the NIROP property. Well 5PC is reportedly 191 feet deep, with a screened interval from 161 to 191 feet in the Prairie du Chien aquifer. A ground water sample collected by NIROP during October 2003 contained 2.7 ug/l of TCE and 160 ug/l of PCE. Kurt Manufacturing Company, at the request of the MPCA, has prepared a potentiometric surface map for the Prairie du Chien aquifer that utilized data from 19 wells over a larger area that includes the Kurt Manufacturing Company Site, the NIROP Site, the FMC Site, the Twin Cities Army Ammunition Plant Site, and MPCA wells (Figure 9). The equipotential map suggests that ground water flow in the aquifer is towards the northwest from the Site and not towards NIROP Monitoring Well 5-PC.

Fridley Municipal Well 13 is located approximately 2,900 feet southwest of the Kurt Manufacturing Company property. Mr. Haukass, Director of Public Works for the city of Fridley, stated the well is used periodically during the high usage summer months. A water sample is collected annually by the city and analyzed for VOCs. Laboratory data supplied by the city of Fridley indicates the target VOCs were not detected in the water samples collected from Fridley well 13 in 2002 and 2003.

Site Visit

A site visit was conducted on December 22, 2004 as part of the Five-Year Review process. The monitoring wells and recovery well referenced in this document are in place and contaminated ground water is being pumped into the POTW collection system.

Interviews

Interviews were conducted with various parties connected to the Site. Mr. Kern Walker, Vice President with Kurt Manufacturing Company, was contacted on January 4, 2005. He stated the project was going well and he had no concerns at this point in time.

An interview was conducted on January 4, 2005 with Ms. Laura Engen, Engineer with MCES, regarding the discharge to the POTW. Ms. Engen stated the discharge from the Kurt Manufacturing Company Site is meeting the requirements of the permit.

Mr. Jon Haukass, Fridley Director of Public Works, was contacted on January 5, 2005. Mr. Haukass said he has not received any specific complaints or comments from the public regarding the ongoing remedy at the Kurt Manufacturing Company Site.

VII. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended and continues to remove VOCs from the aquifer. The VOC concentrations continue to decrease in the shallow and intermediate aquifers, although the PCE concentration at MW-5, MW-6, MW-12 and pumpout Well C, which are located in proximity to the property boundary, continues to exceed the MCL. The PCE concentration at PC-2, which is completed in the Prairie du Chien aquifer, is above the MCL although the concentration decreased significantly between the November 2003 and June 2004 samples. The data suggests that discontinuation of pumping of the deep production well and pumping in the shallow and intermediate aquifers has resulted in the water quality improvements in the on-site Prairie du Chien monitoring wells. Kurt Manufacturing Company has submitted to the MPCA for review a map of the potentiometric surface of the Prairie du Chien aquifer constructed from water levels measured from Prairie du Chien monitoring wells in the Fridley area. The data suggests that ground water flow in the Prairie du Chien aquifer is towards the northwest in the area of the Kurt Site.

The system has been in operation for over 18 years. There do not appear to be operation and maintenance issues that have adversely affected the ground water extraction and treatment system.

The MDH well notification and construction requirements appear to be adequate ground water institutional controls to prevent ground water development and usage on the Kurt Manufacturing Company property.

One of the response actions specified in the MEDD was to cap the area above the former sump at the former metal cuttings storage bin. The area has been capped, although institutional controls have not been implemented which will guarantee long-term maintenance of the cap. A subsurface assessment performed in 1998 indicated that elevated concentrations of VOCs were detected in soil gas samples collected along the exterior of the building. The data indicates that soil gas impacts may be present beneath the building. Institutional controls are needed that address the possibility of residual contaminant concentrations beneath the building should future construction activities occur in the area of the building footprint. Also, institutional controls are needed to prevent the installation of wells in the area of ground water contamination.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Most of the ARARs and the TBCs established at the time of the remedy selection have not changed and are still valid. The RALs have been replaced by HRLs. A separate MCL has been established for cis 1,2-dichloroethene (70 ug/l) and trans 1,2-dichloroethene (100 ug/l). The current MCLs and HRLs are listed in Table 2, which is presented in Section IV.

Question C: Has any other information come to light that could question the protectiveness of the remedy?

There have been some physical changes to the ground water remedy at the Kurt Manufacturing Company Site since completion of the last Five-Year Review. However, the changes do not appear to have affected the effectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

VIII. ISSUES

Table 4 - Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
1. VOCs continue to be detected in some Kurt Manufacturing onsite Prairie du Chien monitoring wells.	Y	Y
2. Additional documentation and discussion should be provided in the semi-annual monitoring reports submitted to the MPCA regarding the remedial system operation, maintenance and monitoring.	N	Y
3. Before Site delisting from the State Superfund list, institutional controls are needed to document the capping at the former sump and the possible presence of contaminants beneath the building.	N	Y
4. VOCs from the Site remain in the shallow and intermediate aquifers in concentrations greater than the HRLs and MCLs.	Y	Y
5. Some water from the groundwater treatment system is used to wash parts in the Kurt Manufacturing Company building. The worker exposure impacts from possible off-gassing of VOCs from this water is not known.	Y	Y

IX. RECOMMENDATIONS

The ground water extraction remedy is removing VOCs and it is recommended that the ground water response actions continue. The following recommendations are:

	Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
						Current	Future
1	Prairie du Chien Aquifer	Need to continue to monitor the onsite Prairie du Chien wells to verify that the downward long-term VOC trends in the onsite Prairie du Chien wells continue. Monitor regional flow in the Prairie du Chien aquifer to confirm interpretation of the Prairie du Chien flow regime.	Kurt Mfg.	MPCA	Ongoing	Y	Y

2	Monitoring Report Adequacy	Need more detail in the monitoring reports submitted to the MPCA regarding the ground water remediation system operation, maintenance and monitoring to better document the status and effectiveness of the system. At a minimum this should include effluent concentration data, pumping rates, discharge volumes, mass removal calculations, maintenance records and a copy of the MCES quarterly reports.	Kurt Mfg.	MPCA	Ongoing	N	Y
3	Institutional Controls	Before Site delisting from the State Superfund list, complete institutional controls that document the need to maintain the cap at the former sump source area and the possibility of contamination beneath the building.	Kurt Mfg.	MPCA	Dec. 2005	N	Y
4	Ground Water Impacts	Continue the operation, maintenance and monitoring of the pumpout system, routine ground water monitoring, and reporting with review and approval by the MPCA.	Kurt Mfg.	MPCA	Ongoing	Y	Y
5	VOC Worker Exposure	Determine the worker exposure impacts from possible off-gassing of VOC's from water from the ground water treatment system.	Kurt Mfg.	MPCA	Ongoing	Y	Y

X. PROTECTIVENESS STATEMENT

The remedy is functioning as intended and is protective of human health and the environment in the short-term. Long-term protectiveness needs to be verified based on the follow-up actions and recommendations. The remedy would be confirmed to be fully protective if recommendations cited in Section IX are implemented so that it can be determined that the performance requirements of the remedy cited in Section IV are being met.

XI. NEXT REVIEW

Hazardous substances, pollutants, or contaminants will remain at the Kurt Manufacturing Company Site that will not allow for unlimited use or unrestricted exposure. EPA or the MPCA, if delegated to do so by EPA, will conduct another Five-Year Review by February 16, 2010.

APPENDIX A

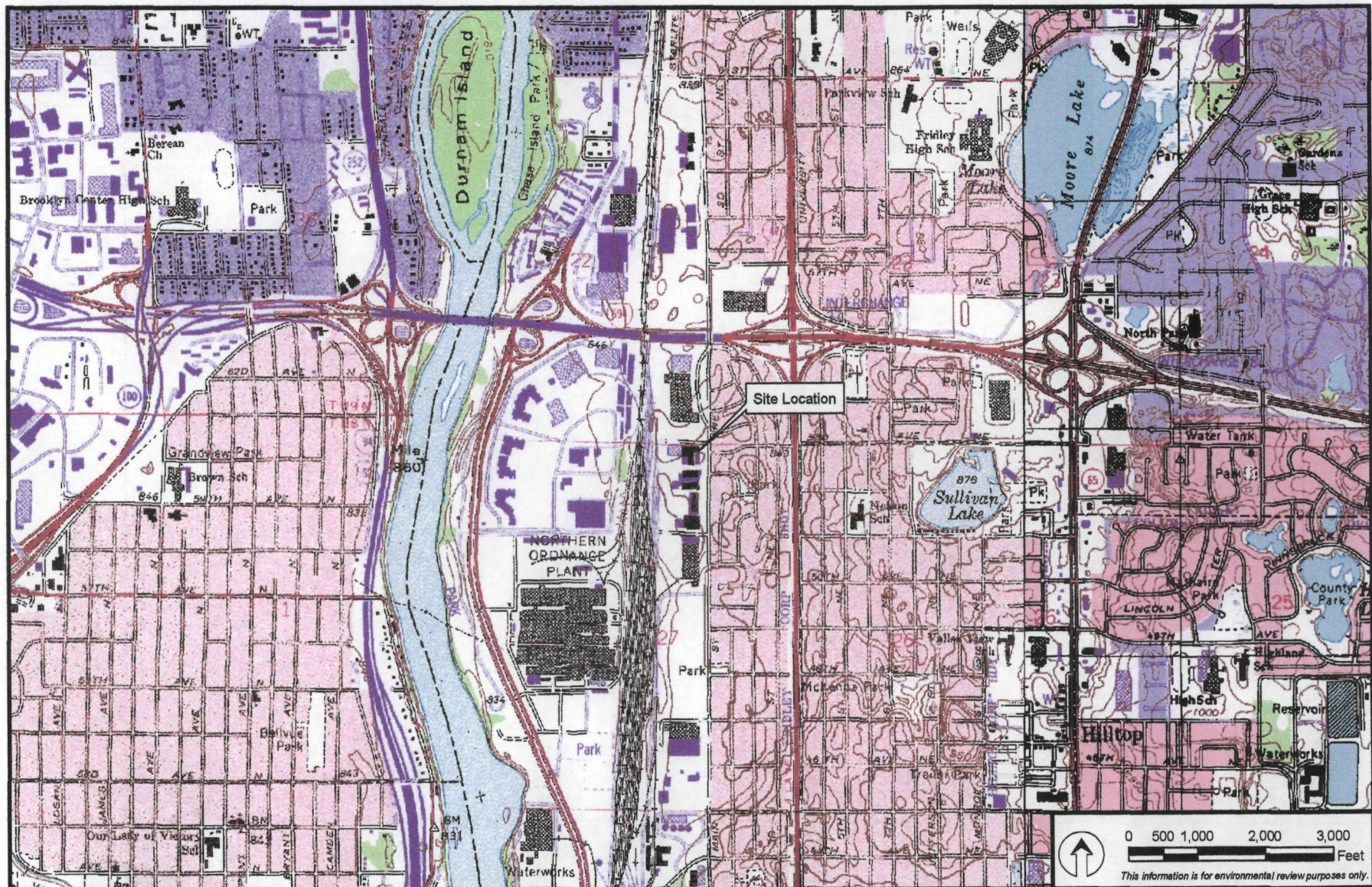


Figure 1
Site Location Map
 Kurt Manufacturing
 Fridley, Minnesota

DATE: 03/23/2001

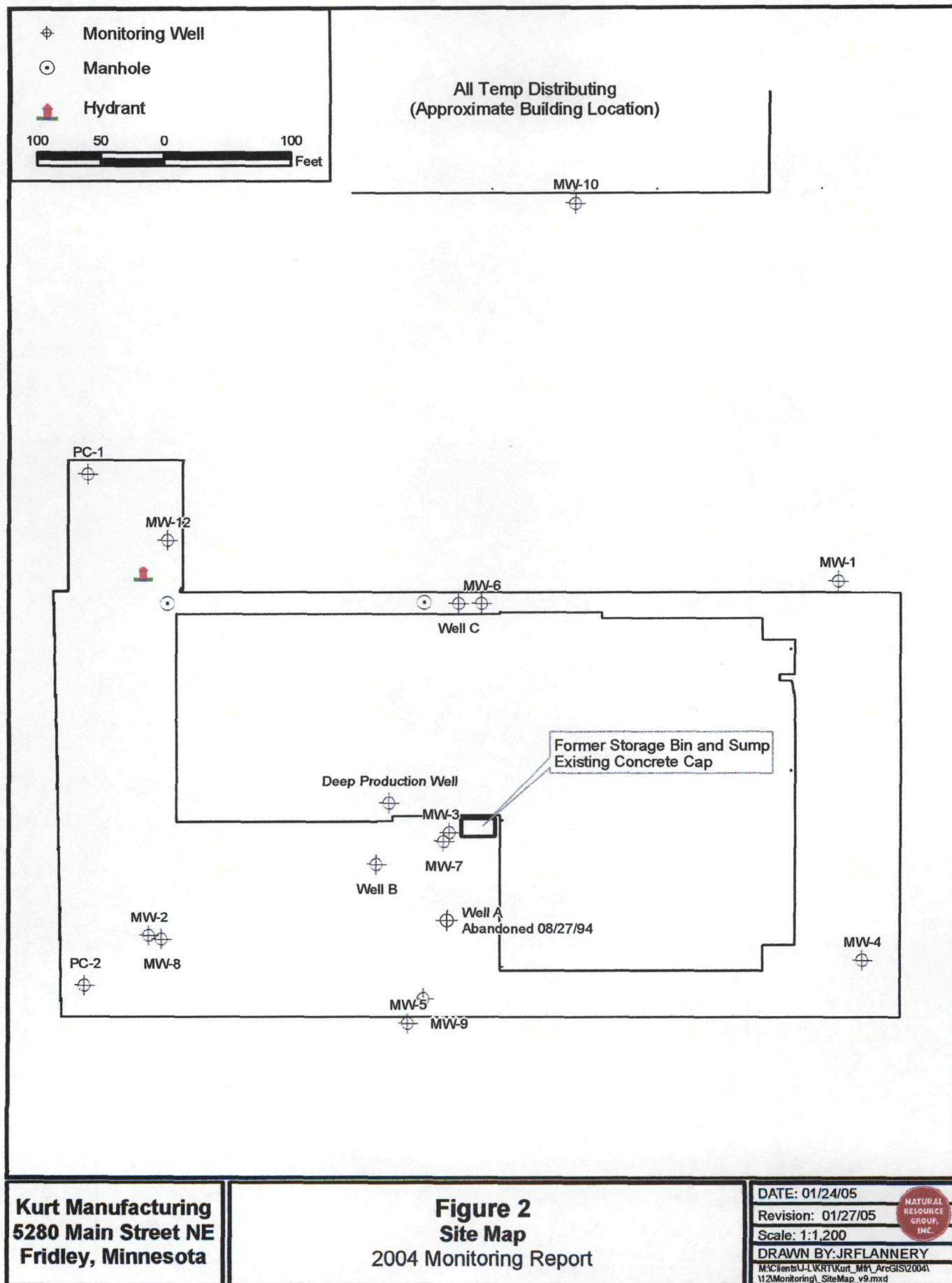
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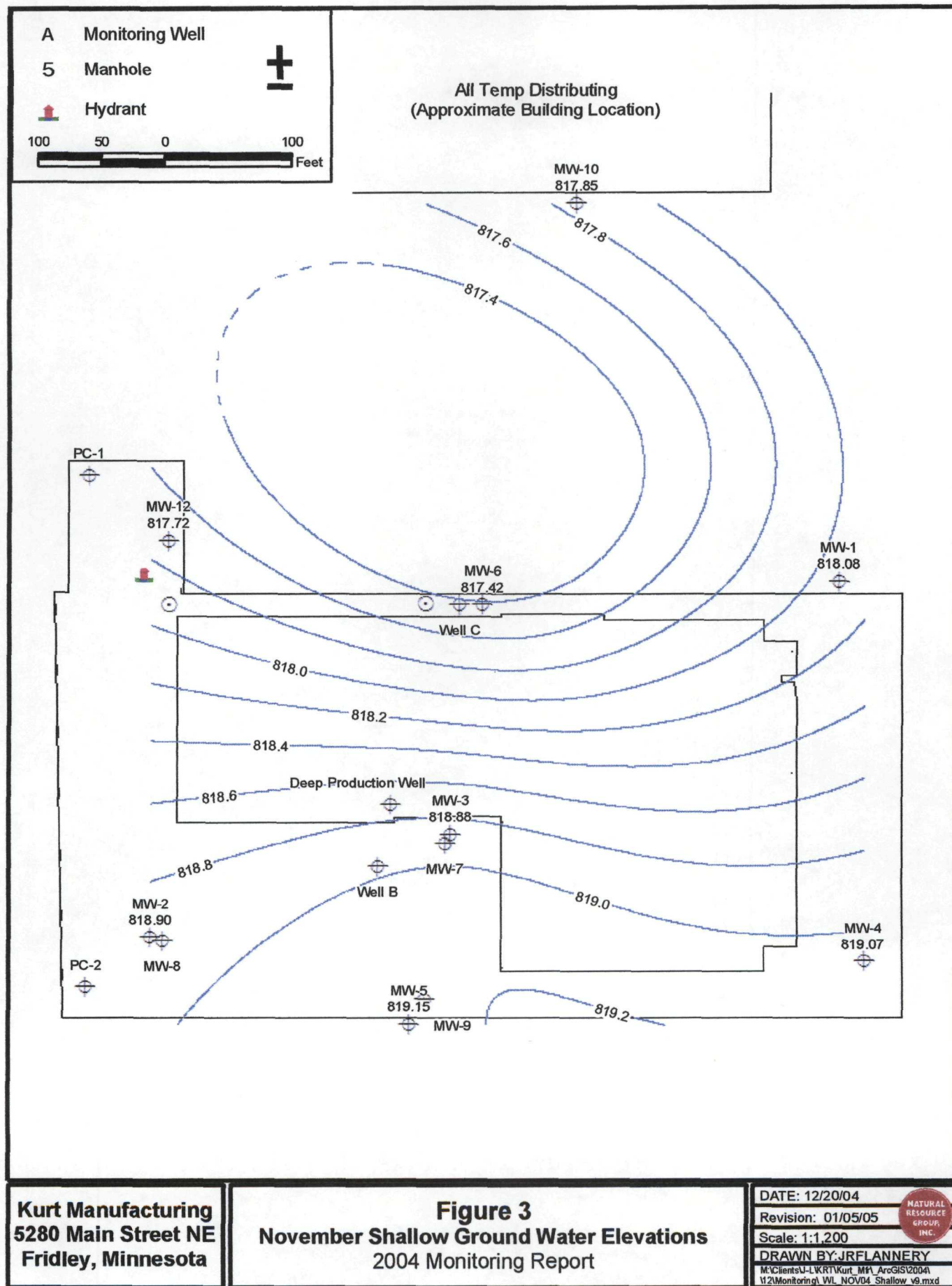
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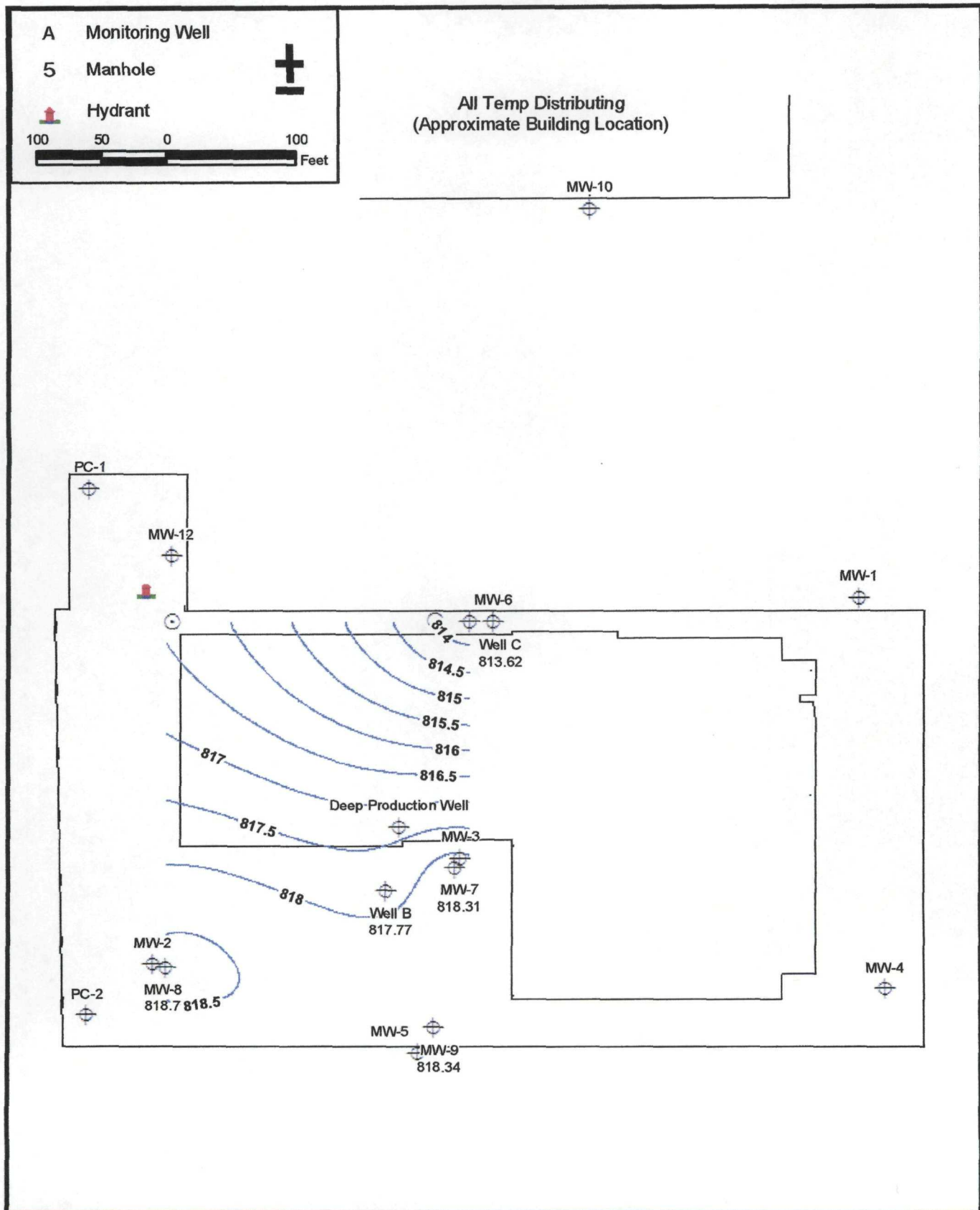
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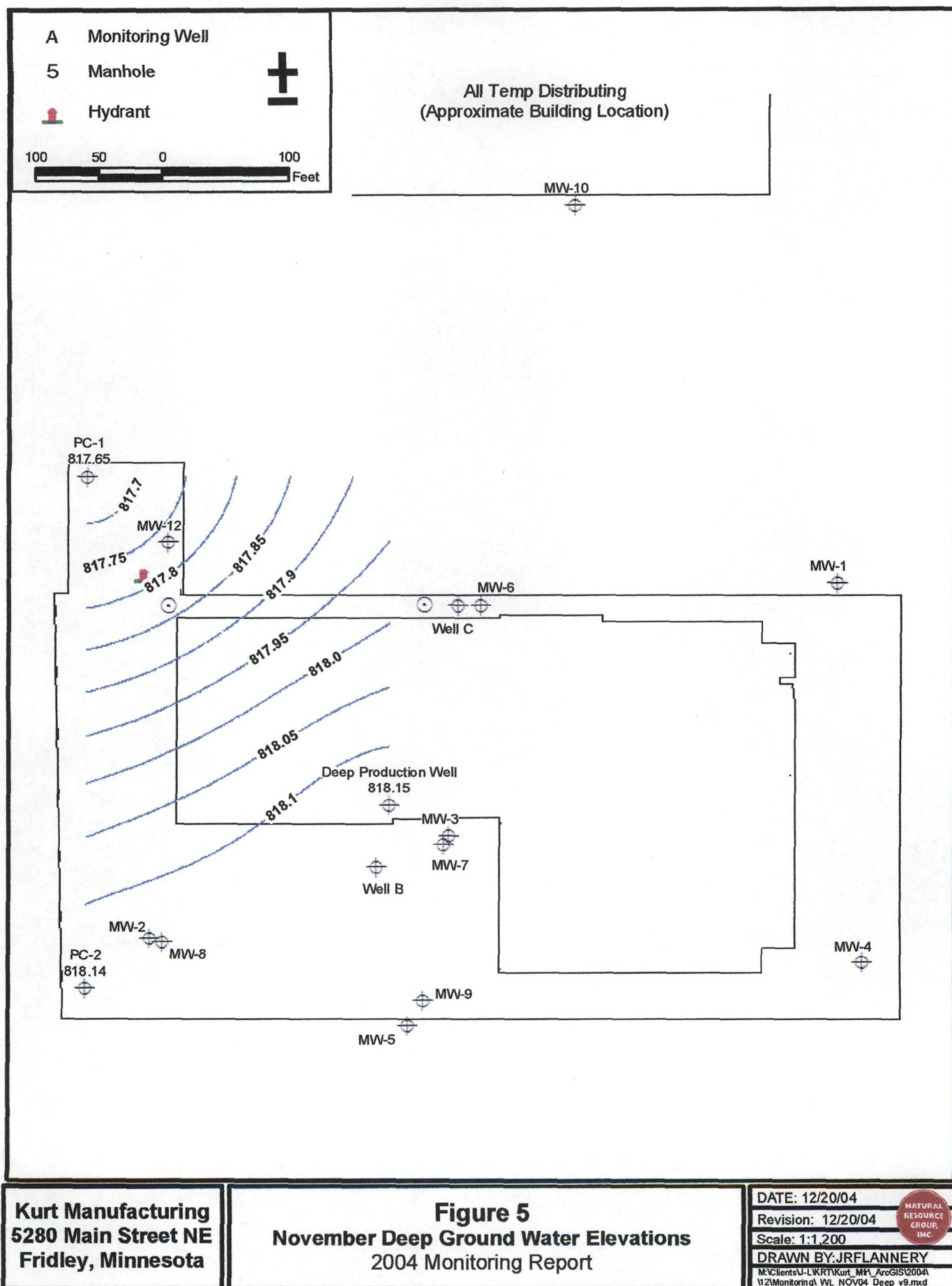


Kurt Manufacturing
5280 Main Street NE
Fridley, Minnesota

Figure 4
November Intermediate Ground Water Elevations
2004 Monitoring Report

DATE: 12/20/04
 Revision: 12/20/04
 Scale: 1:1,200
 DRAWN BY: JRFLANNERY
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NATURAL RESOURCE GROUP, INC.



Kurt Manufacturing
5280 Main Street NE
Fridley, Minnesota

Figure 5
November Deep Ground Water Elevations
2004 Monitoring Report

DATE: 12/20/04
Revision: 12/20/04
Scale: 1:1,200
DRAWN BY: JRFLANNERY
M:\Clients\U-L\KRT\Kurt_MF_ArcGIS\2004
112\Monitoring\WL NOV04 Deep v9.mxd

Figure 6
PCE Concentrations in Ground Water
Shallow Wells

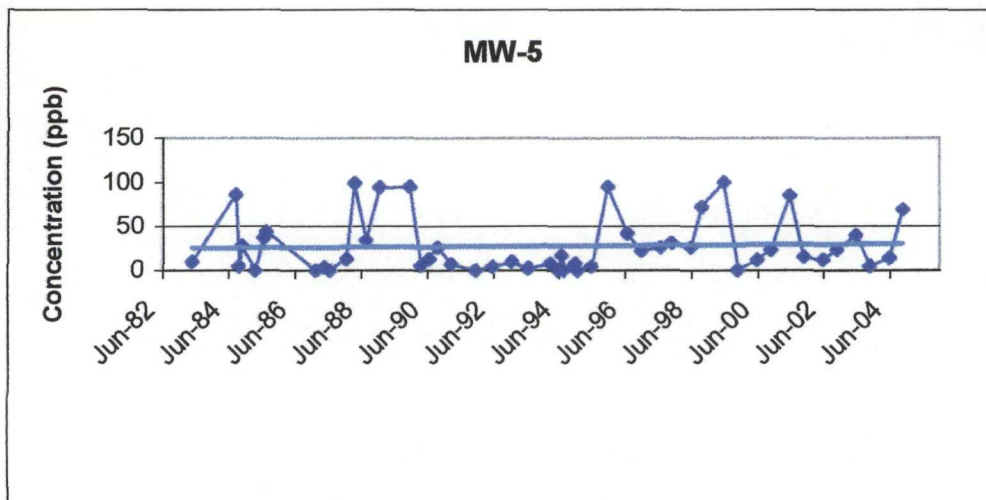
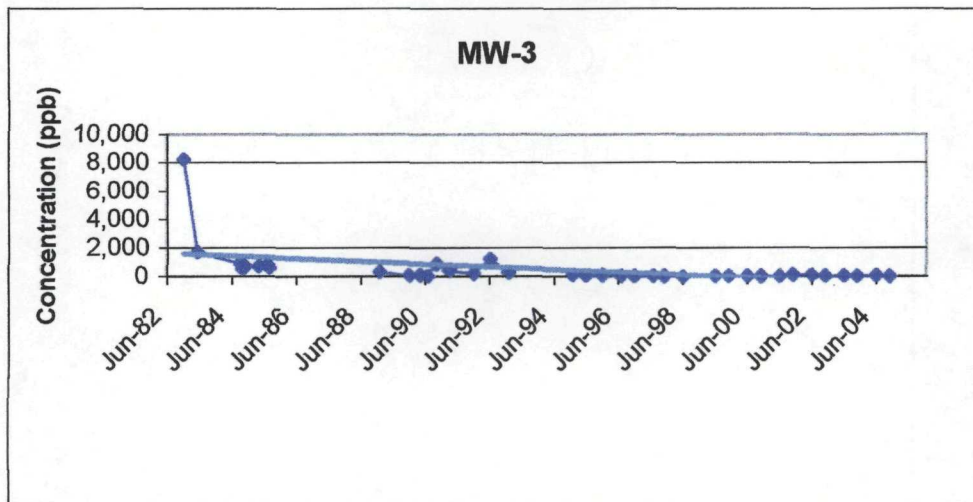
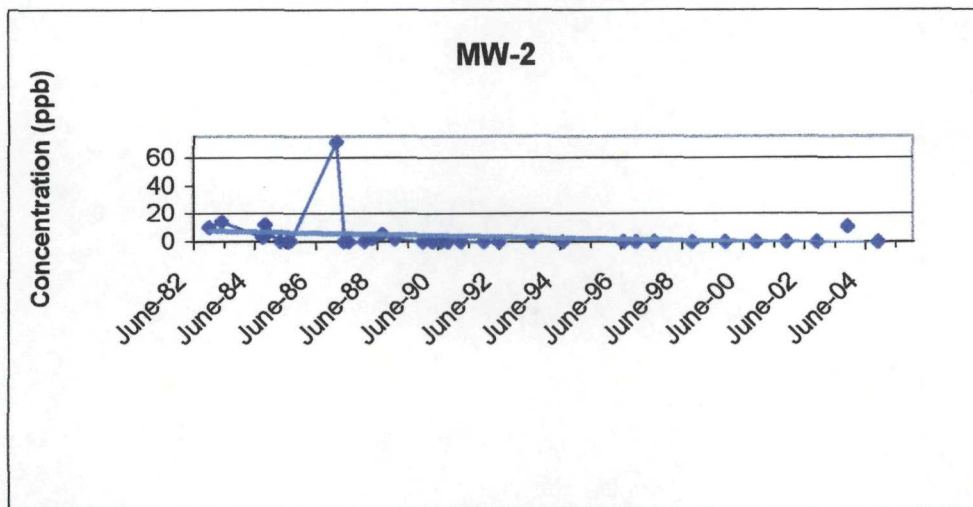


Figure 6
PCE Concentrations in Ground Water
Shallow Wells

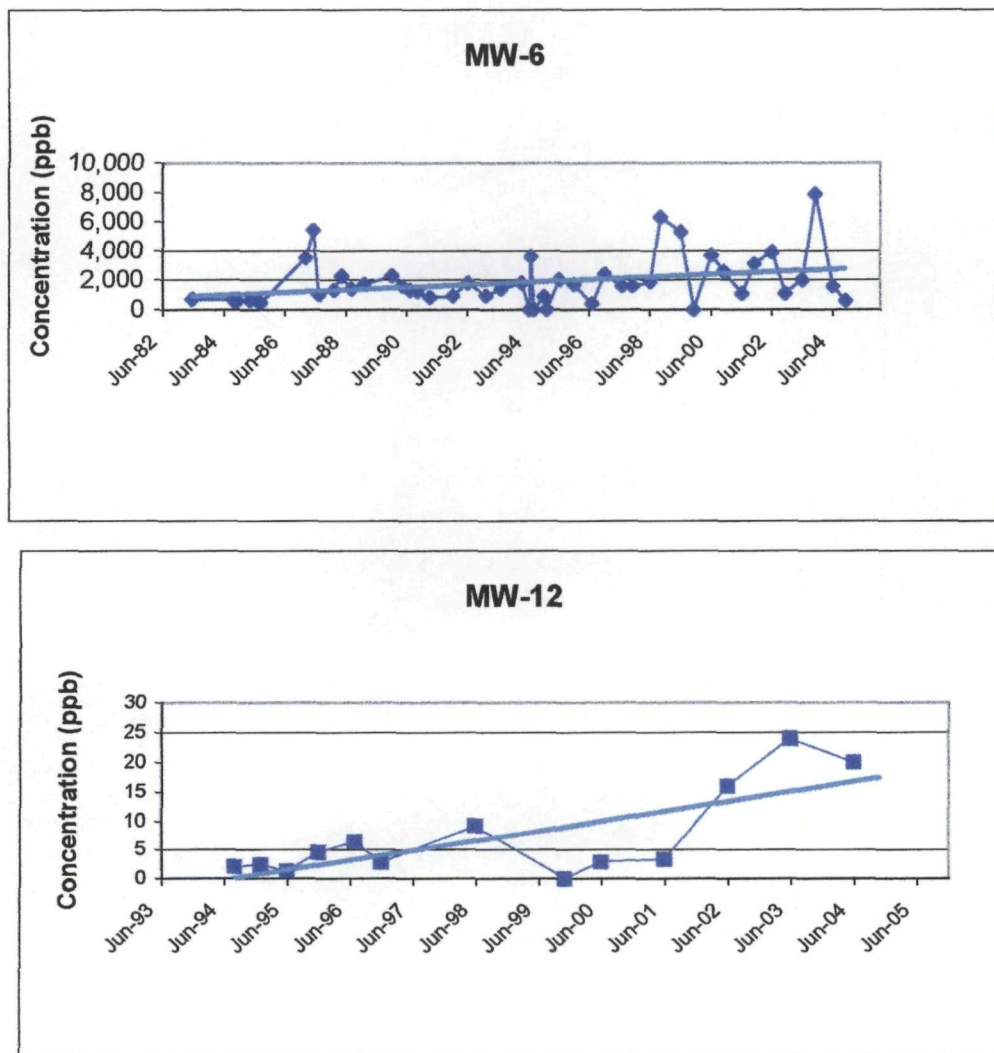


Figure 7
PCE Concentrations in Ground Water
Intermediate Wells

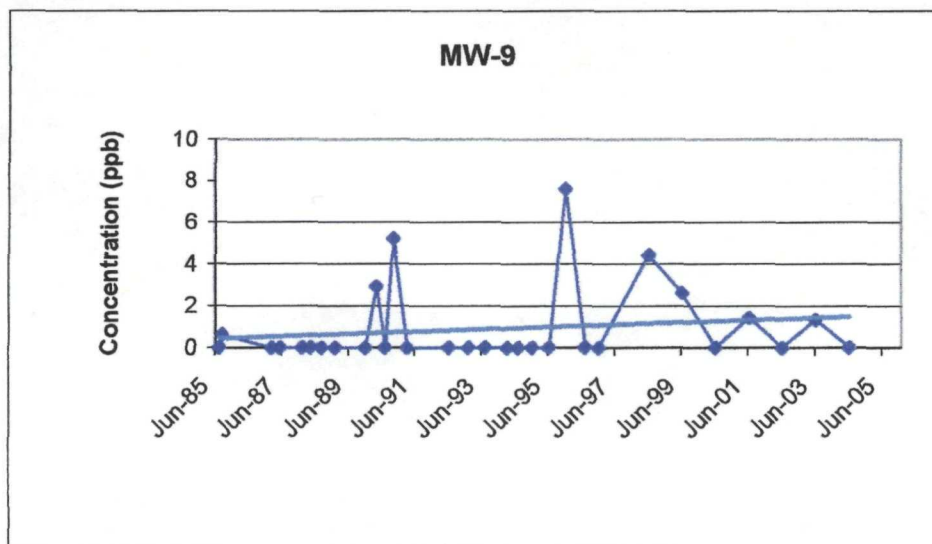
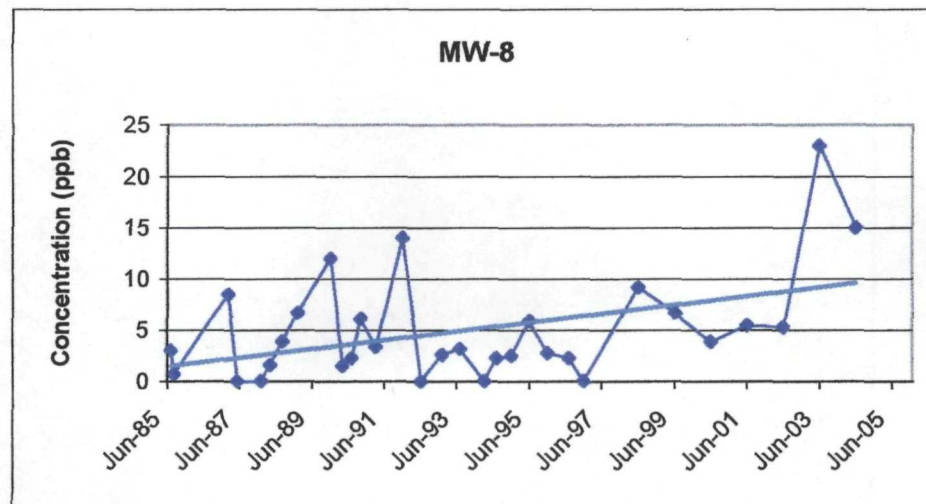
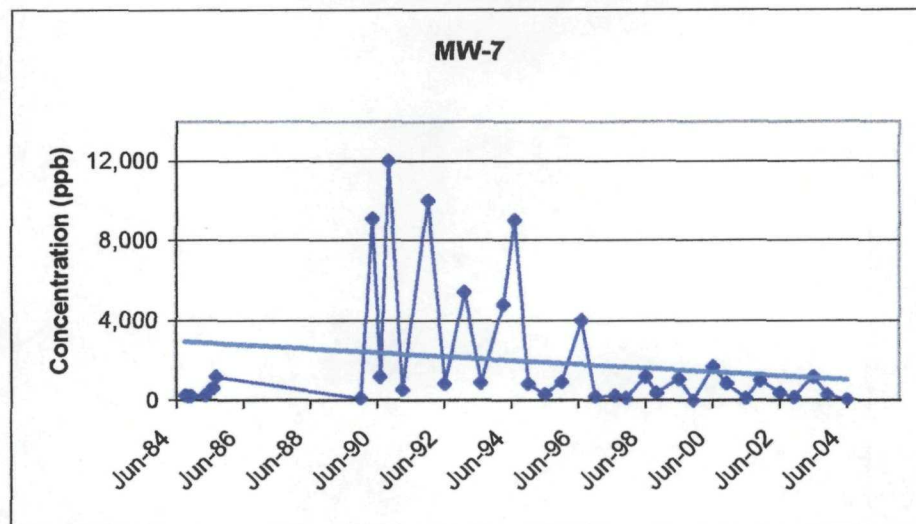


Figure 7
PCE Concentrations in Ground Water
Intermediate Wells

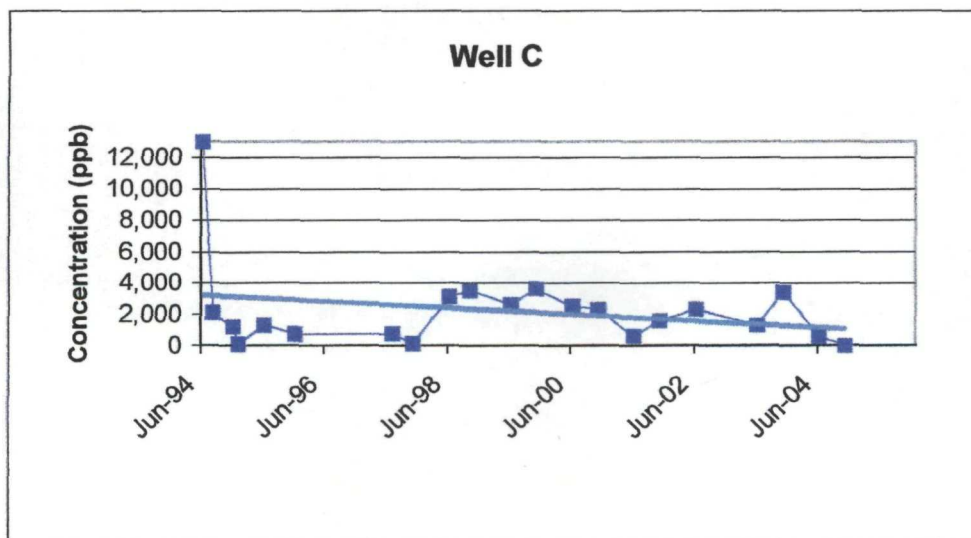
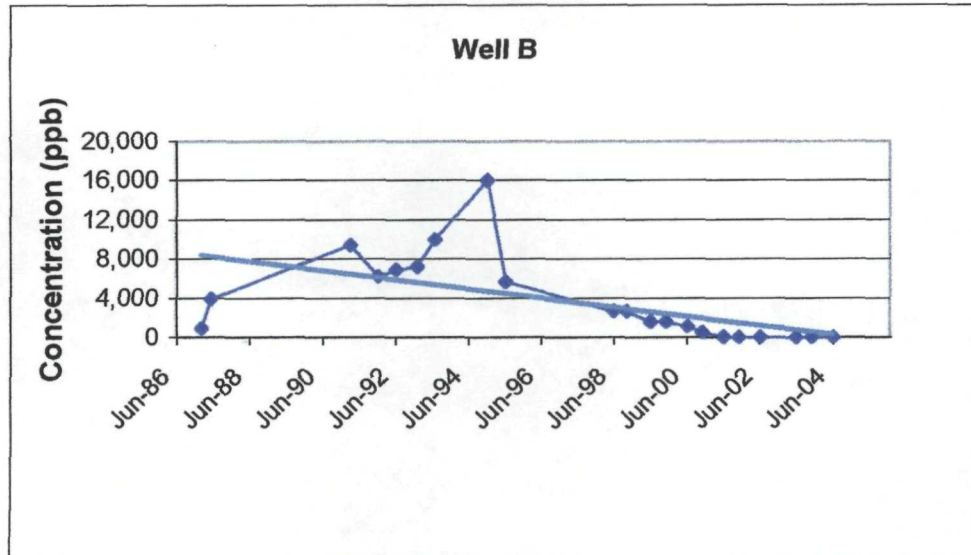
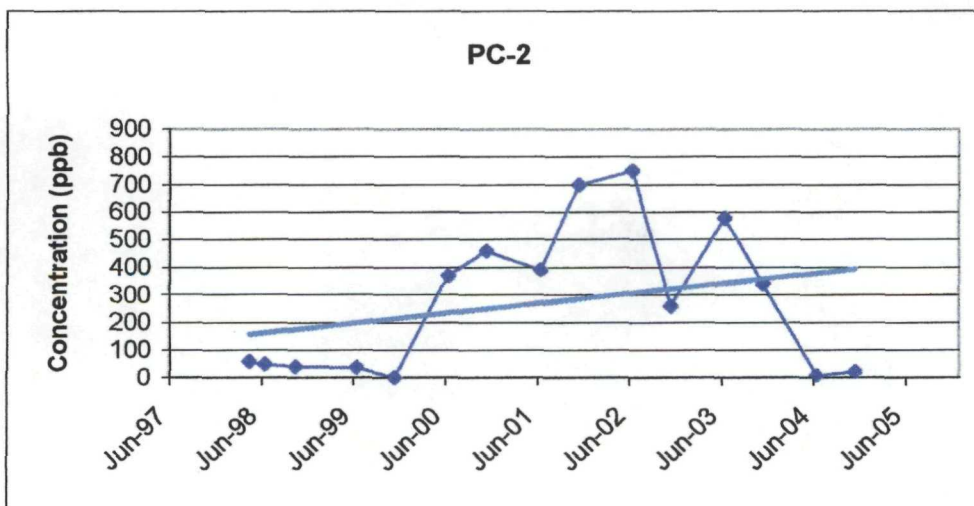
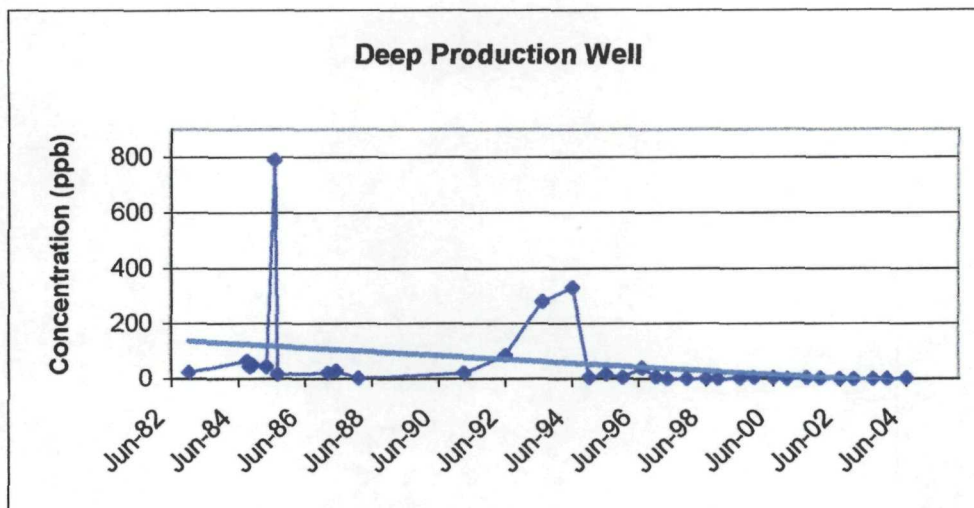
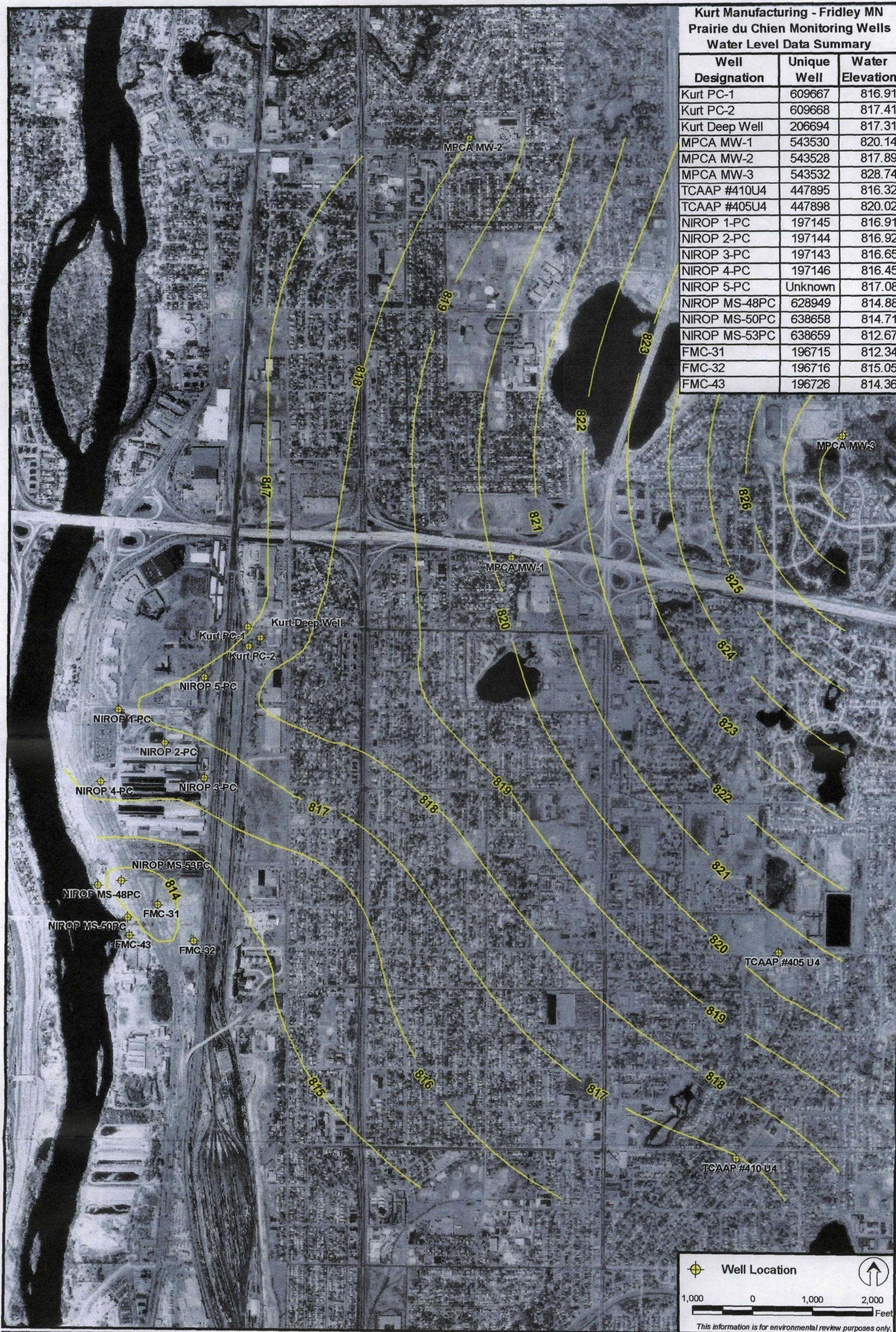


Figure 8
PCE Concentrations in Ground Water
Deep Wells





Kurt Manufacturing - Fridley MN
Prairie du Chien Monitoring Wells
Water Level Data Summary

Well Designation	Unique Well	Water Elevation
Kurt PC-1	609667	816.91
Kurt PC-2	609668	817.41
Kurt Deep Well	206694	817.31
MPCA MW-1	543530	820.14
MPCA MW-2	543528	817.89
MPCA MW-3	543532	828.74
TCAAP #410U4	447895	816.32
TCAAP #405U4	447898	820.02
NIROP 1-PC	197145	816.91
NIROP 2-PC	197144	816.92
NIROP 3-PC	197143	816.65
NIROP 4-PC	197146	816.45
NIROP 5-PC	Unknown	817.08
NIROP MS-48PC	628949	814.88
NIROP MS-50PC	638658	814.71
NIROP MS-53PC	638659	812.67
FMC-31	196715	812.34
FMC-32	196716	815.05
FMC-43	196726	814.36

Well Location

1,000 0 1,000 2,000 Feet

This information is for environmental review purposes only.



Figure 9
Prairie du Chien Potentiometric Surface Map
September 24, 2004
Kurt Manufacturing

DATE: 07/29/2004

REVISED: 02/14/05

SCALE: 1:18,027

DRAWN BY: JRFLANNERY

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APPENDIX B

Bibliography

May 2, 1984, Request for Response Action, Kurt Manufacturing Company, MPCA

Response Order By Consent, August 1984, MPCA

Minnesota Enforcement Decision Document, Kurt Manufacturing Site, Fridley, Minnesota, MPCA, May 13, 1986

Health Assessment for Kurt Manufacturing Company Landfill National Priorities List (NPL) Site, Fridley, Minnesota, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, 1989

Five Year Review, Kurt Manufacturing Site, March 22, 1994, MPCA

Response Action Final Report, Kurt Manufacturing Site, November 30, 1994, Braun Intertec

1997 Annual Monitoring Report, Kurt Manufacturing, Fridley, MN, May 1998, RUST Environment and Infrastructure

Supplemental Investigative Report, Kurt Manufacturing, Fridley, MN, August 1998, RUST Environment and Infrastructure

November 19, 1998, Response to Comments Concerning the Supplemental Investigative Report, Kurt Manufacturing, Earth Tech, Inc.

1998 Annual Monitoring Report, Kurt Manufacturing, Fridley, MN, January 4, 1999, Earth Tech Inc.

June 1999 Sampling Results and Supplemental Investigation, Kurt Manufacturing, Fridley, MN, August 11, 1999, Environmental Resource Group

Five-Year Review, Kurt Manufacturing Superfund Site, Fridley, Minnesota, December 28 1999, MPCA

Annual Monitoring Report November 1999 Sampling Results, Kurt Manufacturing, Fridley, MN, January 26, 2000, Environmental Resource Group

2002 Annual Monitoring Report, Kurt Manufacturing, Fridley, MN, January 29, 2003, Environmental Resource Group

June 2003 Monitoring Report, Kurt Manufacturing, Fridley, MN, July 18, 2003, Environmental Resource Group

2003 Annual Monitoring Report, Kurt Manufacturing, Fridley, MN, January 28, 2004,
Environmental Resource Group

June 2004 Monitoring Report, Kurt Manufacturing, Fridley, MN, August 18, 2004,
Natural Resource Group, Inc.

Site Review and Update, Kurt Manufacturing Company, Fridley, Anoka County,
Minnesota, *Minnesota Department of Health*